CLASS X – MATHEMATICS

ANSWER KEY

(SET–1)

✳ SECTION – A (1 × 20 = 20 Marks)

Q1. HCF of 96 and 404
= **4** ✓ (a)

Q2. Zero of 4x – 12
4x – 12 = 0
x = 3 ✓ (b)

Q3. 2x + 3y = 11
4x + 6y = 22
Second equation is multiple of first → **Infinitely many solutions** ✓ (c)

Q4. a = 3, d = 4
$a_{10} = a + 9d = 3 + 36 = 39$ ✓ (a)

Q5. Probability of tail = **1/2** ✓ (c)

Q6. cos 60° = **1/2** ✓ (b)

Q7. Distance formula
$= \sqrt{[(6–2)^2 + (6–3)^2]}$
$= \sqrt{(16 + 9)}$
$= \sqrt{25} = 5$ ✓ (a)

Q8. $x^2 – 4x + 4$
$D = b^2 – 4ac = 16 – 16 = 0$
Roots are **Real & Equal** ✓ (b)

Q9. Area = $\pi r^2 = (22/7) \times 14^2 = 616\ cm^2$ ✓ (a)

Q10. Median = 9 ✓ (b)

Q11. Ratio of areas = $(2/3)^2 = 4/9$ ✓ (b)

Q12. Tangent ⊥ Radius ✓ (c)

Q13. Volume = $4/3\ \pi r^3$
$= 4/3 \times 22/7 \times 343$
$= 1437.33\ cm^3$ ✓ (a)

Q14. $\tan \theta = 1$
$\theta = 45°$ ✓ (b)

Q15. Mean = (1+10)/2 = 5.5 ✓ (b)

Q16. Mode = 3 ✓ (b)

Q17. $\sin^2\theta + \cos^2\theta = 1$ ✓ (b)

Q18. Surface Area = $6a^2 = 6 \times 16 = 96$ ✓ (b)

Q19. Both true & R correct explanation ✓ (a)

Q20. Both true but R not explanation ✓ (b)

✳ SECTION – B (2 × 5 = 10 Marks)

Q21. HCF by Euclid's Division Algorithm (2 Marks)

225 = 135 × 1 + 90
135 = 90 × 1 + 45
90 = 45 × 2 + 0

∴ HCF = **45**

Q22. 15th Term of AP (2 Marks)

a = 5, d = 4

$a_{15} = a + 14d$
$= 5 + 56$
$=$ **61**

Q23. Roots of $x^2 – 5x + 6 = 0$ (2 Marks)

$x^2 – 5x + 6 = 0$
$(x – 2)(x – 3) = 0$

∴ x = 2, 3

Q24. Mean of Data (2 Marks)

Mean = (4+8+12+16+20)/5
= 60/5
= **12**

Q25. Area of Sector (2 Marks)

Area = $(\theta/360) \times \pi r^2$
= (60/360) × 22/7 × 49
= (1/6) × 154
= **25.67 cm^2**

✳ SECTION – C (3 × 6 = 18 Marks)

Q26. Solve Pair of Linear Equations (3 Marks)

3x – 2y = 5
2x + y = 4

Multiply second by 2:

4x + 2y = 8

Add:

7x = 13
x = 13/7

Substitute:

2(13/7) + y = 4
y = 2/7

∴ Solution = (13/7 , 2/7)

Q27. Opposite Sides of Parallelogram are Equal (3 Marks)

In parallelogram ABCD,
Draw diagonal AC.

In ΔABC and ΔCDA:

AB = CD (Given parallel sides)
BC = AD
AC common

By SAS congruency,
$\Delta ABC \cong \Delta CDA$

$\therefore$ AB = CD and BC = AD
Hence proved.

Q28. Median of Grouped Data (3 Marks)

Total frequency N = 40
N/2 = 20

Median class = 20–30

l = 20
f = 12
cf = 13
h = 10

Median = l + [(N/2 – cf)/f] × h
= 20 + [(20–13)/12] × 10
= 20 + 5.83
= **25.83**

Q29. Height & Distance (3 Marks)

tan 30° = 40 / x
$1/\sqrt{3} = 40/x$

$x = 40\sqrt{3}$
= **69.28 m**

Q30. Sum of 20 Terms (3 Marks)

a = 7, d = 3

$S_n = n/2\ [2a + (n–1)d]$

$S_{20} = 10\ [14 + 57]$
= 10 × 71
= **710**

Q31. Curved Surface Area of Cylinder (3 Marks)

CSA = $2\pi rh$
= $2 \times 22/7 \times 7 \times 10$
= **440 cm^2**

✳ SECTION – D (5 × 4 = 20 Marks)

Q32. Quadratic Formula (5 Marks)

$2x^2 - 7x + 3 = 0$

$x = [7 \pm \sqrt{(49 - 24)}]/4$
$= [7 \pm 5]/4$

$x = 3$ or $1/2$

Q33. Pythagoras Theorem (5 Marks)

In right ΔABC, right angled at B

Construct square on each side.

Area of square on hypotenuse =
Sum of squares on other two sides

Therefore,
$AB^2 + BC^2 = AC^2$

Hence proved.

Q34. Probability (5 Marks)

Total balls = 12

(i) Red = 5/12

(ii) Not blue = 8/12 = 2/3

Q35. Cone melted into spheres (5 Marks)

Volume cone = $1/3\ \pi r^2 h$
= $1/3 \times 22/7 \times 49 \times 24$
= $1232\ cm^3$

Volume sphere = $4/3\ \pi r^3$
= 36π

Number = 1232 / 113.14
≈ **11 spheres**

✳ SECTION – E (Case Study) (12 Marks)

Q36. Circular Park

Radius = 21 m

(i) Circumference = $2\pi r$ = 132 m

(ii) Area = $1386\ m^2$

(iii) Cost = 132 × 100
= ₹13,200

Q38. Ladder Problem

Length = 13m

Height = $13 \sin 60°$
= 11.26 m

Distance = $13 \cos 60°$
= 6.5 m

$\sin^2\theta + \cos^2\theta = 1$ ✓ Verified